SEQUENCE LISTING

<110> Fronticelli, Clara

<120> Polymeric Hemoglobin Mutants

<130> 6056-279 PC

<140> PCT/US99/22756
<141> 2000-05-01

<150> 60/102,640
<151> 1998-10-01

<160> 12

<170> FastSEQ for Windows Version 4.0

<210> 1
<211> 438
<212> DNA
<213> Human

<400> 1
gtgcacctga ctcctgagga gaagtctgcc gttactgccc tgtggggcaa ggtgaacgtg 60
gatgaagttg gtggtgaggc cctgggcagg ctgctggtgg tctacccttg gacccagagg 120
ttctttgagt cctttgggga tctgtccact cctgatgctg ttatgggcaa ccctaaggtg 180
aaggctcatg gcaagaaagt gctcggtgcc tttagtgatg gcctggctca cctggacaac 240
ctcaagggca cctttgccac actgagtgag ctgcactgtg acaagctgca cgtggatcct 300
gagaacttca ggctcctggg caacgtgctg gtctgtgtgc tggcccatca ctttggcaaa 360
gaattcaccc caccagtgca ggctgcctat cagaaagtgg tggctggtgt ggctaatgcc 420
ctggcccaca agtatcac 438

<210> 2
<211> 438
<212> DNA
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Mutant Of
Human Beta-globin

<400> 2
gtgcacctga ctcctgagga gaagtgcgcc gttactgccc tgtggggcaa ggtgaacgtg 60
gatgaagttg gtggtgaggc cctgggcagg ctgctggtgg tctacccttg gacccagagg 120
ttctttgagt cctttgggga tctgtccact cctgatgctg ttatgggcaa ccctaaggtg 180
aaggctcatg gcaagaaagt gctcggtgcc tttagtgatg gcctggctca cctggacaac 240
ctcaagggca cctttgccac actgagtgag ctgcatgctg acaagctgca cgtggatcct 300
gagaacttca ggctcctggg caacgtgctg gtcggtgtgc tggcccatca ctttggcaaa 360
gaattcaccc caccagtgca ggctgcctat cagaaagtgg tggctggtgt ggctaatgcc 420
ctggcccaca agtatcac 438

<210> 3
<211> 146
<212> PRT
<213> Human

<400> 3
Val His Leu Thr Pro Glu Glu Lys Ser Ala Val Thr Ala Leu Trp Gly
1 5 10 15
Lys Val Asn Val Asp Glu Val Gly Gly Glu Ala Leu Gly Arg Leu Leu
20 25 30
Val Val Tyr Pro Trp Thr Gln Arg Phe Phe Glu Ser Phe Gly Asp Leu
35 40 45
Ser Thr Pro Asp Ala Val Met Gly Asn Pro Lys Val Lys Ala His Gly
50 55 60
Lys Lys Val Leu Gly Ala Phe Ser Asp Gly Leu Ala His Leu Asp Asn
65 70 75 80
Leu Lys Gly Thr Phe Ala Thr Leu Ser Glu Leu His Cys Asp Lys Leu
85 90 95
His Val Asp Pro Glu Asn Phe Arg Leu Leu Gly Asn Val Leu Val Cys
100 105 110
Val Leu Ala His His Phe Gly Lys Glu Phe Thr Pro Pro Val Gln Ala
115 120 125
Ala Tyr Gln Lys Val Val Ala Gly Val Ala Asn Ala Leu Ala His Lys
130 135 140
Tyr His
145

<210> 4
<211> 146
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Mutant of
Human beta-globin

<400> 4
Val His Leu Thr Pro Glu Glu Lys Cys Ala Val Thr Ala Leu Trp Gly
1 5 10 15
Lys Val Asn Val Asp Glu Val Gly Gly Glu Ala Leu Gly Arg Leu Leu
20 25 30
Val Val Tyr Pro Trp Thr Gln Arg Phe Phe Glu Ser Phe Gly Asp Leu
35 40 45
Ser Thr Pro Asp Ala Val Met Gly Asn Pro Lys Val Lys Ala His Gly
50 55 60
Lys Lys Val Leu Gly Ala Phe Ser Asp Gly Leu Ala His Leu Asp Asn
65 70 75 80
Leu Lys Gly Thr Phe Ala Thr Leu Ser Glu Leu His Ala Asp Lys Leu
85 90 95
His Val Asp Pro Glu Asn Phe Arg Leu Leu Gly Asn Val Leu Val Gly
100 105 110
Val Leu Ala His His Phe Gly Lys Glu Phe Thr Pro Pro Val Gln Ala
115 120 125
Ala Tyr Gln Lys Val Val Ala Gly Val Ala Asn Ala Leu Ala His Lys

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    130                 135                 140
Tyr His
145
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<210> 5
<211> 141
<212> PRT
<213> Human

<400> 5

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Val Leu Ser Pro Ala Asp Lys Thr Asn Val Lys Ala Ala Trp Gly Lys
 1               5                  10                  15
Val Gly Ala His Ala Gly Glu Tyr Gly Ala Glu Ala Leu Glu Arg Met
            20                  25                  30
Phe Leu Ser Phe Pro Thr Thr Lys Thr Tyr Phe Pro His Phe Asp Leu
        35                  40                  45
Ser His Gly Ser Ala Gln Val Lys Gly His Gly Lys Lys Val Ala Asp
    50                  55                  60
Ala Leu Thr Asn Ala Val Ala His Val Asp Asp Met Pro Asn Ala Leu
65                  70                  75                  80
Ser Ala Leu Ser Asp Leu His Ala His Lys Leu Arg Val Asp Pro Val
                85                  90                  95
Asn Phe Lys Leu Leu Ser His Cys Leu Leu Val Thr Leu Ala Ala His
            100                 105                 110
Leu Pro Ala Glu Phe Thr Pro Ala Val His Ala Ser Leu Asp Lys Phe
        115                 120                 125
Leu Ala Ser Val Ser Thr Val Leu Thr Ser Lys Tyr Arg
    130                 135                 140
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<210> 6
<211> 141
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Mutant Of Human Alpha-globin

<400> 6

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Val Leu Ser Pro Ala Asp Lys Thr Asn Val Lys Ala Ala Trp Gly Lys
 1               5                  10                  15
Val Gly Ala His Ala Gly Glu Tyr Gly Ala Glu Ala Leu Glu Arg Met
            20                  25                  30
Phe Leu Ser Phe Pro Thr Thr Lys Thr Tyr Phe Pro His Phe Asp Leu
        35                  40                  45
Ser His Gly Ser Ala Gln Val Lys Gly His Gly Lys Lys Val Ala Asp
    50                  55                  60
Ala Leu Thr Asn Ala Val Ala His Val Asp Asp Met Pro Asn Ala Leu
65                  70                  75                  80
Ser Ala Leu Ser Asp Leu His Ala His Lys Leu Arg Val Asp Pro Val
                85                  90                  95
Asn Phe Lys Leu Leu Ser His Ser Leu Leu Val Thr Leu Ala Ala His
            100                 105                 110
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Leu Pro Ala Glu Phe Thr Pro Ala Val His Ala Ser Leu Asp Lys Phe
115 120 125
Leu Ala Ser Val Ser Thr Val Leu Thr Ser Lys Tyr Arg
130 135 140

<210> 7
<211> 423
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Mutant of Human alpha-globin

<400> 7
gtgctgtctc ctgccgacaa gaccaacgtc aaggccgcct ggggcaaggt tggcgcgcac 60
gctggcgagt atggtgcgga ggccctggag aggatgttcc tgtccttccc caccaccaag 120
acctacttcc cgcacttcga cctgagccac ggctctgccc aggttaaggg ccacggcaag 180
aaggtggccg acgcgctgac caacgccgtg gcgcacgtgg acgacatgcc caacgcgctg 240
tccgccctga gcgacctgca cgcgcacaag cttcgggtgg acccggtcaa cttcaagctc 300
ctaagccact ccctgctggt gaccctggcc gcccacctcc ccgccgagtt caccccctgcg 360
gtgcacgcct ccctggacaa gttcctggct tctgtgagca ccgtgctgac ctccaaatac 420
cgt 423

<210> 8
<211> 4
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequemce: Factor Xa recognition sequence

<400> 8
Ile Glu Gly Arg
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<210> 9
<211> 27
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Mutagenizing oligonucleotide for human beta-globin Ser9-Cys mutation

<400> 9
ggcagtaacg gcgcacttct cctcagg 27

<210> 10
<211> 27
<212> DNA

<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Mutagenizing oligonucleotide for human beta-globin Cys93-Ala mutation

<400> 10
tgcagcttgt cagcatgcag ctcactc 27

<210> 11
<211> 18
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Mutagenizing oligonucleotide for human beta-globin Cys112-Gly mutation

<400> 11
cagcacaccg accagcac 18

<210> 12
<211> 423
<212> DNA
<213> Human

<400> 12
gtgctgtctc ctgccgacaa gaccaacgtc aaggccgcct ggggcaaggt tggcgcgcac 60
gctggcgagt atggtgcgga ggccctggag aggatgttcc tgtccttccc caccaccaag 120
acctacttcc cgcacttcga cctgagccac ggctctgccc aggttaaggg ccacggcaag 180
aaggtggccg acgcgctgac caacgccgtg gcgcacgtgg acgacatgcc caacgcgctg 240
tccgccctga gcgacctgca cgcgcacaag cttcgggtgg acccggtcaa cttcaagctc 300
ctaagccact gcctgctggt gaccctggcc gcccacctcc ccgccgagtt cacccctgcg 360
gtgcacgcct ccctggacaa gttcctggct tctgtgagca ccgtgctgac ctccaaatac 420
cgt 423